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A geological sketch of the Tucson region by Professor Wm. P. Blake, makes up nearly one-fourth of the text of the volume. Further topics are: the vegetation about Tucson; the temperature, water and soil relations of plants; conditions contributory to deserts; meteorology; soil; formation and extent of deserts and the influence of deserts on life. A folding map shows the chief deserts of the world and two maps in the text exhibit the conceptions of American deserts current in 1835 and 1859. The typical features of deserts are stated as inadequate rainfall, with undeveloped drainage, active wind erosion, great daily temperature range, low relative humidity, soils nearly free from humus and xerophytic vegetation. The ratio between rainfall and evaporation, rather than the absolute amount of either, determines the desert.

It is observed that gradual modifications through a long series have been shown by the study of animals but not of plants, which secure new adaptations rather by sports and saltatory derivatives. The volume closes with interesting observations on desert travel, particularly in reference to the obtaining and use of water and of the juices of desert plants. A. P. B.

The Relation of Desert Plants to Soil Moisture and to Evaporation. By Burton Edward Livingston. 78 pp., Diagrams, Tables, and Bibliography. The Carnegie Institution, Washington, D. C. 1906. Price, 40 cents.

The object of this monograph is the better understanding of the mode of existence of plants which thrive at the extreme limits possible to such organisms. As Alpine plants live under difficult conditions of temperature, so desert plants must survive a high degree of dryness. It is believed that basal principles in the life of plants may be more surely reached in such fields than by studies of growth in a normal environment. The researches embodied in this paper were begun at the Desert Laboratory in 1904 and completed later at the University of Chicago. The data are presented under the general division of "soil studies," "atmospheric studies" and "plant studies," and chiefly relate to conditions found adjacent to the Laboratory.

It was ascertained that the deeper layers of soil contained even at the end of the spring dry season a considerable amount of water. The real surface of evaporation lies below the surface of the ground and the moisture finds protection, since the top layers serve as a dust mulch. Certain species, after germinating, elongate the primary root rapidly and while this is going on the aërial part of the plant makes little growth. While desert plants adapt themselves somewhat to dry soils, this is not deemed "of prime importance." The physical relation of soils and water is discussed under the heads of permeability, rate of downward movement, retaining power, power of soil to raise water from lower levels and the resistance offered by the soil to water absorption by roots. Under "plant studies" we find treated,—water requirement for germination, transpiration of desert plants with numerous graphic illustrations, water requirement of certain plants, and osmotic pressure of cactus juices. The bibliography at the close of the paper includes 32 titles. A. P. B.